Technical Datasheet

Spark Detection and Suppression System

The spark detection and suppression system is designed to prevent explosions in industrial facilities that transport or process combustible dust.

In these types of processes, sparks or incandescent particles generated by equipment, friction, or impurities in the material can act as effective ignition sources, capable of causing explosions in equipment such as filters, cyclones, silos, or bucket elevators.

The system continuously monitors the interior of ducts and equipment using highly sensitive optical detectors, identifying these ignition sources at an early stage. Upon detecting a spark, the system automatically activates a water-based suppression device, generating a controlled spray that cools and extinguishes the particle before it reaches areas with an explosive atmosphere.

It serves as a key preventive measure within the explosion protection strategy, preventing the event from occurring and reducing the risk of property damage, production downtime, and risks to people.

Key Advantages

- Early detection of ignition sources.
- Ultra-fast automatic response
- High operational reliability and continuous system monitoring
- Optimized water consumption during suppression
- Flexible configuration based on the process
- Suitable for explosive atmospheres. Available in certified versions for installation in ATEX-classified zones.

Standards & Certification

- ATEX Directive 2014/34/EU
- Certification for Zone 20 and Zone 21
- IECEx certification (depending on model)
- Technical reference: EN 1127-1 (Explosion prevention)
- Applicable guideline: VdS 2106 (spark suppression systems)

Applications

Systems designed for installations at risk of dust explosions where ignition sources may be generated by hot particles in conveying or collection systems.
Typical applications:

- Pneumatic powder conveying systems.
- Extraction and filtration systems
- Cyclone separators
- Silos and hoppers
- Bucket elevators
- Grinding, crushing and drying processes
- Installations in the food, wood, paper, chemical, pharmaceutical, cereal processing, biomass and recycling industries.

Main Characteristics

Dust type	Organic and metallic powders
Recommended minimum water pressure	5 bar. Controlled water dosing
Main power supply	230 V AC (-10 % / +15 %)
Output voltage	24 V DC (máx. 2 A)
Emergency power supply	Built-in battery (up to 4 h)
Operating current	200 mA
Connection	up to 4 detectors per line
Outputs	programmable relays
Spark counter with configurable threshold	1–999 sparks per unit of time
Communication	Optional interface (ProfiNet / OPC depending on configuration)

Components

> **BM6 spark detection unit.**

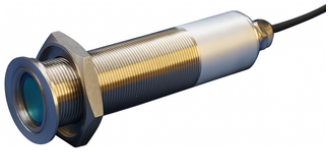
Microprocessor-controlled spark alarm unit, featuring an intuitive touchscreen display (alarms, number of sparks, etc.).

- Continuous system monitoring
- Display of alarms and number of sparks detected
- Logging of up to 2,500 events
- Configuration of thresholds and response logic
- Integrated emergency power supply (up to 4 hours)
- 4 programmable relays per line
- Optional communication interface
- IP55 protection

> **FST spark explosion detector.**

A sensor designed to detect, using infrared technology, the light emitted by an explosion, even in the very first moments.

- Installation in enclosed duct systems where light may be present (but without direct sunlight on the detector's optics) up to 60°C.
- IP 65 protection rating.
- Maximum ambient temperature: 60°C.
- Supplied with a pre-assembled cable (2 m) and connector for connection to the circuit board in the KK3.
- For installation in Zone 20
- Also available with IECEX marking



> **FSK spark detector.**

A sensor designed to detect, using infrared technology, the light emitted by an explosion, even in the very first moments.

- Installation in enclosed piping systems without exposure to external light
- Protection rating: IP 65.
- Maximum ambient temperature: 60°C.
- Supplied with a pre-assembled cable (2 m) and connector for connection to the circuit board in the KK3.
- For installation in Zone 20
- Also available with IECEX marking

> **FSL spark explosion detector.**

A sensor designed to detect, using infrared technology, the light emitted by an explosion, even in the very first moments.

- Installed outside the pipe and therefore away from the hot zone.
- Up to 3 light conductors can be connected.
- Protection rating IP 65.
- Maximum ambient temperature: 60°C.
- Maximum pipe temperature 290°C (requires the use of additional light conductors)
- With pre-assembled cable (2m) and connector for connection to the circuit board in the KK3.

> **FLA connection kit for the sprinkler system.**

Prefabricated unit for supplying water via an existing sprinkler system. Consisting of:

- 2" DFW flow controller
- Ball valve for draining
- 2" ball valve for shut-off
- 2" non-return valve
- VdS DS3 safety pressure switch
- Stainless steel pipe adapter

> **H4/B4 audible and visual alarm.**

Alarm unit for spark or fault alarms.

- Voltage: 24 VDC
- Current consumption: 430 mA
- Dimensions (W x H x D): 110 x 173 mm x 81 mm
- Protection rating: IP 66
- Temperature range: -40°C to +55°C
- Maximum sound level: 100 dB

Accesories

> **SP2D-R VA-24V-M automatic fire extinguisher.**
Fire extinguisher with a real-time nozzle for instantaneous extinguishing over a 120° angle.
- It comprises a ball valve, a solenoid valve, a filter and a fire-extinguishing nozzle with a special quick-release coupling.
- For duct diameters up to 800 mm.
- For installation in Zone 21

> **SP1D-R VA-24V-M automatic fire extinguisher.**
Fire extinguisher with a real-time nozzle for instantaneous extinguishing over a 120° angle.
- It comprises a ball valve, a solenoid valve, a filter and a fire-extinguishing nozzle with a special quick-release coupling.
- For duct diameters up to 400 mm.
- For installation in Zone 21.

> **Self-cleaning unit using compressed air blow-off.**
Adapter for applying compressed air upstream of the light guide.
- The air consumption of an air bleed valve at 1 bar is approximately 70 l/min.

> **WDS pressure boosting system.**
The WDS ensures the safe operation of the automatic fire-extinguishing system by supplying the required amount of water at the necessary pressure for each extinguishing process.
- It consists of a pressure vessel, a pump, a pressure switch, a DFW flow switch, a pressure switch, a high-pressure hose and a pump control unit.

> **LL500 FST high-temperature (flexible) adapter.**
High-temperature adapter for the thermal decoupling of the FST-type detector.
- Total length 500 mm.
- Includes a mounting bracket for screwing in front of the FST spark detector.
- Withstands temperatures of up to 300 °C.

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